



US005403772A

United States Patent [19][11] **Patent Number:** **5,403,772****Zhang et al.**[45] **Date of Patent:** **Apr. 4, 1995****[54] METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE**

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[21] Appl. No.: **160,908**

[22] Filed: **Dec. 3, 1993**

[30] Foreign Application Priority Data

Dec. 4, 1992 [JP] Japan 4-350545
Jul. 27, 1993 [JP] Japan 5-204775

[51] Int. Cl.⁶ **H01L 21/20**

[52] U.S. Cl. **437/101; 437/51; 437/174; 437/200; 437/233; 257/66**

[58] Field of Search **437/101, 51, 200, 201, 437/174, 173, 233; 257/66**

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[57] ABSTRACT

A method for manufacturing a semiconductor device such as a thin film transistor using a crystal silicon film is provided. The crystal silicon film is obtained by selectively forming films, particles or clusters containing nickel, iron, cobalt, ruthenium, rhodium, paradium, osmium, iridium, platinum, scandium, titanium, vanadium, chrome, manganese, copper, zinc, gold, silver or silicide thereof in a form of island, line, stripe, dot or film on or under an amorphous silicon film and using them as a starting point, by advancing its crystallization by annealing at a temperature lower than a normal crystallization temperature of an amorphous silicon. A transistor whose leak current is low and a transistor in which a mobility is high are obtained in the same time in structuring a dynamic circuit having a thin film transistor by selectively forming a cover film on a semiconductor layer which is to become an active layer of the transistor and by thermally crystallizing it thereafter.

27 Claims, 9 Drawing Sheets